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ORIGINAL RESEARCH

Efficacy of Pericoccygeal Local Injection with Rectal Manipulation in the Treatment of Chronic Coccygodynia

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Abstract

Objective: Coccygodynia, a condition primarily affecting women, is characterized by pain localized around the coccyx, which is aggravated by activities such as sitting, sexual intercourse, defecation, or transitioning from a seated to a standing position. Although a range of conservative treatments, including NSAIDs, ice application, and physical therapy, are commonly employed, a subset of patients fails to achieve symptom relief. This study aims to evaluate the efficacy of rectal manipulation combined with paracoccygeal steroid injections in patients with chronic coccygodynia unresponsive to conservative treatments.

Material-Method: This retrospective study involved 24 patients (20 females and 4 males) with chronic coccygodynia that persisted despite more than three months of conservative treatment. All patients received a combination of steroid-local anesthetic injections and rectal manipulation. VAS scores were recorded before intervention, on the 10th day post-intervention, at one year, and at the last follow-up visit. Patients were assessed for trauma history, BMI, coccyx type, and dynamic radiographic findings.

Results: The mean VAS score significantly decreased from 7.9 pre-treatment to 2.2 on the 10th day post-treatment ($p<0.001$). This improvement persisted with mean VAS scores of 2.9 at one year and 2.7 at the last follow-up, although a slight, non-significant increase was noted over time. Patients with hypermobility of the coccyx showed significantly higher VAS scores at the last follow-up compared to those without hypermobility ($p=0.009$). No significant differences in treatment outcomes were observed between traumatic and atraumatic etiologies or between normal and overweight BMI groups

Conclusion: The combination of paracoccygeal steroid injections and rectal manipulation appears to be an effective treatment for chronic coccygodynia, with a significant reduction in pain scores. Hypermobility of the coccyx may be associated with higher recurrence rates, warranting further investigation into tailored treatments for this subgroup.

Keywords: Coccygodynia, Manipulation, Injection.

INTRODUCTION

Although coccygodynia more commonly affects women, it can be seen at any age and describes symptoms of pain around the coccyx[1,2]. Pain may radiate to the lower extremities or genital area. Sitting may aggravate the pain, while sexual activity, defecation, or the onset of mobilization to a standing position may also increase symptoms. Prolonged standing and inappropriate sitting positions may also cause back pain[2]. Direct falls, trauma, and prolonged sitting on hard surfaces are particularly significant causes of coccygodynia. Additionally, conditions such as pilonidal cysts, infections, tumors, physiological abnormalities, bursitis, and pathologies of visceral organs can also contribute to the

development of this condition. Some cases in which no cause for the symptoms can be found are also considered idiopathic. The exact incidence of coccygodynia is unknown. Although it can be seen at any age, it is usually detected more frequently in the fourth decade[3,4].

Conservative treatment is primarily preferred in coccygodynia. Non-steroidal anti-inflammatory drugs, ice packs, acupuncture, Extracorporeal Shock Wave Therapy (ESWT), hot baths, physiotherapy, coccygeal cushion and rectal manipulation are used in conservative treatment [5,6]. Osteopathic Manipulative Treatment (OMT) is another conservative method that can be beneficial for patients with coccygodynia. OMT utilizes hands-on techniques to diagnose, treat, and prevent various illnesses or injuries. The methods employed in OMT may include stretching, gentle pressure, and the application of resistance. In the context of coccygodynia, OMT can help alleviate pain and improve mobility by addressing musculoskeletal imbalances and enhancing circulation to the affected area[7,8].

Minimal interventional procedures such as direct injections around the coccyx, ganglion impar block/blockade, caudal epidural blocks, neurolysis can be performed in patients who do not respond to conservative treatment[9]. Coccygectomy can be performed in patients who do not benefit from all of these[9].

Coccygeal massage and levator ani stretching exercises can be performed with the intention of treating the tonic spasm thought to be responsible for the pain. Rectal manipulation was first described by Ambroise Pare in 1634[10]. Thiele described levator ani massage in the treatment of chronic coccidinia. In addition, he also recommends coccyx massage[11]. Maigne recommends mobilization of the coccyx extension with stretching of the levator ani muscle[12]. Different conservative methods can be combined in resistant cases[4,5].

The aim of this study was to investigate whether rectal manipulation in addition to paracoccygeal steroid injection improves treatment efficacy in patients with chronic coccidia.

MATERIALS AND METHODS

Patients who were followed up with conservative treatments (nonsteroidal anti-inflammatory therapy and use of coccygeal cushion) for more than 3 months between 2017 and 2019 in a single center and who did not respond to treatment were included in the study. Written informed consent was obtained from all patients. Inclusion criteria were defined as persistent coccygeal pain for more than 3 months and no abnormality in laboratory findings or imaging to explain the pain. Exclusion criteria were pregnancy, uncontrolled diabetes mellitus, local skin infection, previous coccygectomy, sacrococcygeal fusion, and previous interventional treatment. Patients with a follow-up period of less than 2 years and those who did not attend follow-up visits were excluded from the study.

All patients received a combination of steroid-local anesthetic mixture injection and rectal manipulation. A total of 24 patients [20 females (83.3%) and 4 males (17.7%)] were included in the study. Visual Analog Scale (VAS) recorded before the intervention, on the 10th day after the intervention, at one year and at the last follow-up visits were evaluated. Patients were questioned about previous trauma and time of symptom onset. Anteroposterior/lateral plain radiographs were taken in all patients. To evaluate the mobility of the coccyx, standing and sitting dynamic lateral radiographs were taken. In these radiographs, a coccygeal angulation of more than 25 degrees was considered hypermobility. Magnetic Resonance Imaging was also performed to exclude underlying pathologies. Body-mass index (BMI) was calculated in all patients. Coccyx types were determined according to the Postacchini-Massobrio classification[13]. Patients were classified according to the etiology of pain (traumatic or atraumatic), body mass index (normal or overweight), anatomical type of the coccyx.

Technical

Patients were positioned in the prone position for the procedure. After the coccygeal area was sterilized, 3 cc (60 mg) prilocaine hydrochloride was administered, followed by 1 cc (40 mg) methylprednisolone acetate, and 5 cc solution containing 4 cc (20 mg) bupivacaine hydrochloride was injected blindly into the paracoccygeal area. Combined rectal manipulation and massage was started 5 minutes after the injection. Levator ani massage described by Thiele was applied for 3 minutes[14].

The coccyx was then flexed, stretching and mobilized for one minute as described by Maigne[15]. Patients were advised to use a coccygeal cushion for 3 months and NSAII (dexketoprofen trometamol, 25 mg, twice daily) for 10 days after the procedure.

Statistical analysis

SPSS 15 (SPSS Inc., Chicago, IL, USA) program was used for analysis. Friedman test was used for repeated measurements and Wilcoxon Signed Ranks

test was used for post hoc analysis. Mean values of different groups were compared using Kruskal-Wallis test. Mann-Whitney U test was used for post hoc analysis. P value less than 0.05 was considered statistically significant.

RESULTS

The mean age of the patients was 37.2 (range 24-56) years. The mean duration from the onset of complaints until the procedure was performed was 19.1 (range 3-60) months. The mean follow-up period was 32.5 (range 24-50) months at the last follow-up visit (Table 1).

Table 1. Patient demographic characteristic (n:24)

Characteristic	Total
Age, mean	37.2
Sex (Female)	20 (%83.3)
BMI, mean	26.1
Mean duration from the onset of complaints until the procedure	19 months

The mean VAS score was 7.9 (range 5-10) before treatment and 2.2 (range 0-7) in the early post-treatment period (10th day). This change was statistically significant (P<0.001). The VAS scores at 1 year after the procedure and at the last follow-up were 2.9 (range 0-8) and 2.7 (range 0-8), respectively. Accordingly, there was a slight increase in the VAS score in the early and long-term controls, but this increase was not statistically significant (p=0.167). In six patients (25%), VAS score, which decreased in the early post-procedure period, increased in the last control. The mean VAS scores of these patients before and after the procedure were 7.8 (range 8-10) and 2.9 (range 1-4), respectively. VAS score at the last follow-up was 6.5 (range 4-7) and this increase was statistically significant (p=0.003).

The etiology was trauma in 15 (62.5%) patients, idiopathic in 8 (33.3%) and birth trauma in 1 (4.1%) patient. The mean BMI of the patients was 26.1 (range 17-40) kg/m2. According to the Postacchini-Massobrio classification, there were 7 (29.1%) Type I, 12 (50%) Type II, 4 (16.6%) Type III and 1 (4.1%) Type IV patient. There was no correlation between coccyx type and VAS scores before or after the procedure (p=0.657).

Dynamic radiography revealed a hypermobile coccyx in 12 (50%) of the patients. The mean pre-procedure VAS score of the patients with hypermobility was 8.1 (range 5-10) and 7.8 (range 5-9) in those without hypermobility and there was no significant difference between them (p=0.622). In the early post-procedure period, the mean VAS score was 2.5 (range 2-7) with hypermobility and 2.1 (range 0-8) in those without hypermobility and there was no significant difference between them (p=0.350). At the last follow-up visit, the mean VAS score was 5.8 (range 1-9) in those with hypermobility and 2.1 (range 0-7) in those without hypermobility, and the difference was statistically significant (p=0.009).

Patients were grouped as normal and overweight group according to BMI. The mean VAS score was 8 (range 5-10) in the overweight group and 7.9 (range 5-9) in the normal group before the procedure. After the procedure, these values were 2.4 (range 0-7) in the overweight group and 2 (range 0-8) in the normal group. There was no significant difference between the two groups before and after the procedure (p=0.910, P=0.090, respectively).

Patients were divided into two groups according to etiology as traumatic (15 patients) and atraumatic (9 patients). In the traumatic group, the mean VAS score was 7.8 (range 5-10) before the procedure, 2.2 (range 0-7) and 2.4 (range 0-8) in the early post-procedure period and at the last follow-up, respectively. In the atraumatic group, the mean VAS score was 8 (range 5-10) before the procedure, 2.1 (range 0-6) and 2.4 (range 0-7) in the early post-procedure period and at the last follow-up, respectively. In both groups, the pre- and post-procedure VAS scores were significant (p=0.008), while the change in VAS at follow-up was not significant (p=1 in the traumatic group and p=160 in the atraumatic group). When the traumatic and atraumatic groups were compared with each other, there was no significant difference between the two groups both before and after the procedure (p=0.808 before the procedure, p=0.860 in the early post-procedure period, p=0.790 in the final follow-up) (Table 2).

Table 2. VAS scores according to etiology

VAS score	Traumatic (n:15)	Atraumatic (n:9)	P value
Before the procedure	7.8	8	0.808
Early post-procedure period	2.2	2.1	0.860
Last follow-up	2.4	2.4	0.790

DISCUSSION

Coccygodynia, which affects women five times more than men, is most commonly traumatic or idiopathic. Coccygodynia is primarily caused by trauma to the coccyx from direct impact, prolonged sitting, or fetal

pressure during pregnancy. Additionally, anomalies in the soft tissues of the mid-sacral region, chronic inflammation of the coccygeal bursa, spasm of the pelvic floor muscles, pilonidal sinus, and lower sacral nerve root arachnoiditis are also potential contributors to coccygeal pain[1,2,16].

In our study, complaints were idiopathic in 8 patients (33.3%), 15 patients (62.5%) had a history of trauma. Only 1 patient (4.1%) had postpartum onset of coccygodynia.

Spasticity or other anomalies affecting the musculature of the pelvic floor have been found to be important in patients with coccygodynia[1]. The rationale for massage is to treat tonic spasm by stretching the anatomical structures around the coccyx that are thought to cause pain. Mobilization and stretching maneuvers of the sacrococcygeal and intercoccygeal joints are performed to increase coccygeal mobility. Maigne and Chatellier compared massage, mobilization and stretching methods and reported 29.2%, 16% and 32% success rates respectively after 6 months of follow-up[17].

If non-invasive treatments fail, corticosteroid injections are performed in the sacrococcygeal region[18,19]. In our patients with chronic coccygodynia, our aim with the manipulation technique combined with paracoccygeal local steroid injection was to reduce the local inflammatory response and then to reduce the pain with manipulations. The high success rate in our study (60% complete pain relief at the last control) may be due to the addition of steroid injection to the procedure.

There are different methods in the conservative treatment of coccygodynia and NSAIDs and coccygeal cushions are generally used primarily[1,5]. Fogel et al. reported that NSAIDs, coccygeal cushions and stool softeners used for 8 weeks reduced symptoms[4]. Kwon et al. also reported that the threshold period for the distinction between acute and chronic is 8 weeks[20]. Different treatment modalities may be tried in persistent cases. Steroid injection is claimed to be effective in cases of persistent pain for more than 6 months, while extracorporeal shock wave therapy has been reported to give more satisfactory results than physical modalities in coccygodynia[6,21].

In the management of chronic coccygodynia, various complementary and alternative treatments have been explored to enhance patient outcomes. OMT is a modality that has gained attention for its holistic approach in treating musculoskeletal disorders. OMT involves techniques such as myofascial release, muscle energy techniques, and counterstrain, which aim to improve the functional biomechanics and alleviate pain. Studies have shown that OMT can effectively reduce pain and improve mobility in patients with chronic pain conditions, making it a promising adjunct to conventional therapies for coccygodynia[7,8,22]. Another innovative approach is laser acupuncture, which combines traditional acupuncture principles with low-level laser therapy. This technique uses laser light to stimulate specific acupuncture points without the use of needles, offering a non-invasive alternative. While more extensive clinical trials are needed, preliminary findings suggest that laser acupuncture could be an effective treatment option for chronic coccygodynia, particularly for patients who are reluctant to undergo needle-based acupuncture[23].

Coccygectomy, which is one of the treatment options that can be preferred in refractory pain, has a high complication rate (20-30%), especially postoperative infection[1,4]. Despite this, good or excellent results are obtained in 60-90% of patients[24].

We used perirectal injection followed by manipulation in our study, which included patients who had persistent coccygodynia for more than 3 months and who had used coccygeal cushions and painkillers during this period. In a study comparing steroid injection alone with steroid injection after manipulation, the success rate was reported to be 59% and 85%, respectively. In the same study, the late recurrence rate in the group with combined treatment was 28%[2]. There was a decrease in VAS in 92% of our patients included in the study. Therefore, we think that our success rate increased because we combined injection with manipulation. In addition, the rate of late recurrence in 25% of our patients was similar to the literature.

Obesity seems to be a factor in the occurrence of coccygodynia. In a study by Fogel et al. it was reported that more coccygodynia was observed in obese patients[4]. In our study, 25% of the patients were overweight. No difference was found between normal weight and overweight patients. Maigne et al. stated that the configuration of the coccyx may change in overweight patients[17]. Accordingly, they stated that obese patients had more posterior subluxation, whereas normal weight patients had more normal configuration of the coccyx and may have hypermobility. In thin patients, they stated that there may be more spicules and anterior subluxation may be seen. Hypermobility was present in half of our patients and the VAS score was significantly higher in the hypermobile group compared to the

normal group at the last follow-up. This suggests that there may be more recurrence in patients with hypermobility.

In conclusion, the combination of paracoccygeal steroid injections and rectal manipulation appears to be an effective treatment for chronic coccygodynia, with a significant reduction in pain scores. Hypermobility of the coccyx may be associated with higher recurrence rates, warranting further investigation into tailored treatments for this subgroup.

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Author contributions: Conceptualization: (MAC, RAE, KU); Design: [KU]; Writing: [MAC, MKY]; Investigation/Data collection: [MAC, AIT,]

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